

# Flora of the Bhillangna Valley of the erstwhile Tehri-Garhwal State

BY

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This paper gives an account of a collection of plants from the Bhillangna Valley of Tehri-Garhwal, made during the years 1963 to 1965 during which nearly 1400 specimens of 410 species were collected. The area covered by this study includes river valleys, glacier beds, mountain slopes and meadows ranging in altitude between 600 and 4200 metres.

## INTRODUCTION

The Bhillangna Valley derives its name from the Bhillangna River which runs through the entire length of the valley. The Bhillangna River originates from Khatling Glacier, is fed in its course by Kshirganga near Mahsar Tal and Balganga at Baunr, and finally meets the Bhagirathi River at Tehri. Tehri-Garhwal, of which the Bhillangna Valley is a part, lies entirely within the Himalayan ranges between 30° 20'-30° 50' N, and 78° 35'-78° 55' E and covers an area of about 1000 sq. miles. It is surrounded by Ramain and Bashahr in the north, Tibet in the east, Pauri Garhwal in the south and Dehra Dun in the west. The region consists of a series of ridges separated by narrow valleys running north-east to south-west, and radiating from the lofty peaks bordering Tibet.

Burrard & Hayden (1907) divided the Himalayas into three zones ; the greater Himalayas, the lesser Himalayas and the Siwaliks. The area selected for exploration lies in the former two zones. The Greater Himalayan ranges are composed of granite and crystalline rocks and are characterized by the presence of snowy peaks, the average height of which exceeds 6500 m. The lesser Himalayan ranges are made of sedimentary rocks such as slate, quartzite, conglomerate and limestone and their altitude ranges between 1800 m. and 3000 m.

From climatic point of view the Bhillangna Valley can be divided into three zones similar to Hooker's three climatic zones of Western Himalayas.

1. *Tropical Zone* : Extends up to an altitude of 1500 m., the lower limit of snow-fall during winter. Annual rainfall 203 to 228 cm. The

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temperature rarely falls below freezing point, and in May it rises to 40.56°C or above. The monsoon starts about the middle of June and lasts up to the end of September. Mist increases the humidity to saturation point. In autumn due to continuous sunshine the humidity decreases. Spring is the hottest season of the year.

2. *Temperate Zone* : Extends from 1500 m. to 3600 m. the upper limit of trees. Here the temperature is lower and precipitation less with considerable portion of it received as snow. The annual precipitation falls as rain. Autumn is characterized by sunshine and low humidity. During winter the temperature falls below -11.11°C. In spring the temperature rises and the humidity is very low.

3. *Alpine Zone* : The alpine zone is above 3600 m. Here winters are cold and growing season for plants is short. Spring and autumn seasons are practically eliminated. Precipitation is very small and mostly in the form of snow. Winters are characterized by heavy snow-fall. This zone is characterized by large spreading meadows.

Recently R. K. Gupta (1956) gave a brief description of the flora of Tehri-Garhwal. In Bhillangna Valley he confined his studies to Mahsar Tal, Sashsar Tal, Chandrabadni and Ghansali, from where he described about 250 plant species. A greater part of the valley, however, remained unexplored.

This paper presents a fairly comprehensive account of the flora of Bhillangna Valley. An extensive exploration of the valley was undertaken by the authors during 1963, 1964 and 1965 during the months of March, April, May, June, July, August, September and October. Eighteen localities situated in river valleys, glacier beds, mountain slopes and meadows, scattered over an area of about 680 sq. miles, were covered during the course of study. Most of the area was covered on foot. There is a motor road from Tehri to Ghansali. From Ghansali onwards there are no proper means of communication and therefore the whole journey from Ghansali to Ghuttu, and from Ghuttu to Rupagali (Ponwali route), and from Ghuttu to Kalayani (Mahsar route) was performed on foot. On the Ponwali route, Gawana (2100 m.) was the last village. On the Mahsar Tal route, Gangi (2700 m.) was the last inhabited spot above which we came across large meadows. In Gangi people live on *phapru* (*Fagopyrum esculentum*), *alu* (*Solanum tuberosum*), *marcha* (*Amaranthus paniculatus*) and their chief domestic animals are goats, rarely cattle. Being a country of widely varying topography a large variety of plants of different climatic zones were collected. At altitudes above 3000 metres snow covered peaks were a common feature and alpine herbs like species of *Caltha*, *Potentilla*, *Primula* and dwarf *Rhododendron* were blooming. The valley is important from the point of view

of medicinal plants. About 20 species of medicinal plants are exported from here to the markets of Hardwar, Dehra Dun and Delhi. In recent years the importance of the valley has further increased due to its suitability for the cultivation of medicinal plants. Sandoz Ltd. selected Matia, near Ponwali (3240 m.) for the cultivation of an important species of medicinal plant, *Podophyllum hexandrum* from which Podophyllin, an alleged cure for cancer, is obtained. Ponwali and Matia have been considered suitable for the cultivation of another important medicinal plant, *Nardostachys jatamansi*.

410 species of plants belonging to 90 families were collected during the study. The Table gives a summary of the collections made.

TABLE

	Families	Genera	Species
Dicotyledons ..	79	276	362
Monocotyledons ..	8	31	41
Gymnosperms ..	3	5	7

In the detailed enumeration the following procedure has been adopted. To facilitate easy reference the order of the families of flowering plants is the same as in Hooker's FLORA OF BRITISH INDIA (1872-97). Every effort has been made to bring the nomenclature up-to-date. All the specimens included in the list are preserved in the herbarium of the Survey of Medicinal Plants Unit, Gurukula Kangri Vishwavidyalaya, Dist. Saharanpur. Brief mention is made of the locality and altitude of occurrence of each species.

## LIST OF PLANTS COLLECTED DURING 1963-65

## RANUNCULACEAE

- |   |   |
|---|---|
| <b>Aconitum falconeri</b> Stapf<br>Ponwali, Rajkhark, 3000-<br>3600 m. ; <i>Uniyal</i> 3134 & 3602. | <b>Aquilegia pubiflora</b> Wall. ex Royle<br>Gangi 2700 m. ;<br><i>Uniyal</i> 781 & 3851. |
| <b>A. heterophyllum</b> Wall.<br>Ponwali 3000 m. ;<br><i>Uniyal</i> 1646, 1490 & 3601.              | <b>Caltha palustris</b> Linn.<br>Ponwali 2700 m. ;<br><i>Uniyal</i> 898, 665 & 1240.      |
| <b>A. laeve</b> Royle<br>Ponwali 3300 m. ; <i>Dey</i> 1265.   | <b>Clematis buchananiana</b> DC.<br>Ghuttu 2100 m. ; <i>Uniyal</i> 1680.                  |

- C. barbellata** Edgew.  
Ponwali 3300 m. ; *Saxena* 895.
- C. nepaulensis** DC.  
Ponwali 2800 m. ; *Saxena* 1253.
- Delphinium denudatum** Wall. ex Hook.  
Indrola 1200 m. ; *Uniyal* 704.
- D. vestitum** Wall. ex Royle  
Tali 3300 m. ; *Uniyal* 605.
- Paeonia emodi** Wall.  
Margaon 2100 m. ;  
*Uniyal* & *Saxena* 1208.
- Ranunculus hirtellus** Royle  
Ponwali 2800 m. ; *Uniyal* 1213.
- R. laetus** Wall.  
Ghuttu 1600 m. ; *Dey* 1206.
- Thalictrum alpinum** Linn.  
Tali 3600 m. ; *Uniyal* 882.
- T. javanicum** B1.  
Ponwali 3300 m. ; *Uniyal* 1487.
- T. foliolosum** DC.  
Alaknanda Range 2400 m. ;  
*Uniyal* 3600.
- T. reniforme** Wall.  
Ponwali 2800 m. ; *Uniyal* 3672.

MAGNOLIACEAE

- Michelia champaca** Linn.  
Cultivated at Ghuttu 900 m. ;  
*Dey* 1321.
- Schizandra grandiflora** Hook.  
f. & Th.  
Ghuttu 2700 m. ; *Uniyal* 1098.

MENISPERMACEAE

- Cissampelos pareira** Linn.  
Indrola 900 m. ; *Uniyal* 3335.
- Stephania glabra** Miers.  
Ghansali 900 m. ; *Uniyal* 721.
- Cocculus laurifolius** DC.  
Ghansali 900 m. ; *Uniyal* 3358.

BERBERIDACEAE

- Berberis asiatica** Roxb.  
Ghuttu 1800 m. ; *Saxena* 486.
- B. lycium** Royle  
Ghansali 900 m. ; *Uniyal* 576.
- B. chitria** Lindl.  
Mataya 2700 m. ; *Uniyal* 441.
- Podophyllum hexandrum** Royle  
Ponwali and Rajkhark 3000 m. ;  
*Uniyal* 1097 & 3832.
- B. coriaria** Brand.  
Ponwali 2800 m. ; *Uniyal* 683.

PAPAVERACEAE

**Meconopsis aculeata** Royle

The Himalayan blue poppy, at Tali 3600 m. ; *Uniyal* 3122.

FUMARIACEAE

**Corydalis govaniana** Wall.

Ponwali 3000 m. ; *Uniyal* 3326.

**C. cornuta** Royle

Ponwali 2800 m. ; *Uniyal* 3440.

**C. ramosa** Wall. ex Hook. f.

Mataya 2800 m. ; *Uniyal* 1774.

**Fumaria indica** Pugsley

Chamba 1600 m. ; *Uniyal* 493.

VIOLACEAE

**Viola biflora** Linn.

Gangi-Kalayani 2400 m. ;  
*Saxena* 1183.

**V. serpens** Wall.

Ghuttu 1800 m. ; *Uniyal* 681.

CRUCIFERAE

**Barbarea vulgaris** Br.

Tali-Rajkhark 3300 m. ;  
*Uniyal* 816.

**Erysimum hieracifolium** Linn.

Kalayani 2700 m. ; *Uniyal* 1335.

**Capsella bursa-pastoris** Medic.

Ponwali 3000 m. ; *Uniyal* 1360.

**Eutrema primulaefolium** Hook.  
f. & Th.

Tali 3600 m. ; *Uniyal* 1277.

**Cardamine impatiens** Linn.

Ghuttu 2400 m. ; *Saxena* 797.

**Megacarpaea polyandra** Benth.

Tali 3600 m. ; *Uniyal* 864.

FLACOURTIACEAE

**Flacourtia indica** Merr.

Ghonti 900 m. ; *Uniyal* 3655.

POLYGALACEAE

**Polygala abyssinica** R. Br.

Chamba 1600 m. ; *Dey* 1048.

**P. crotalariodes** Buch.-Ham.

Gangi 2100 m. ; *Saxena* 798.

**P. chinensis** Linn.

Ghansali 900 m. ; *Uniyal* 1604.

**P. persicariaefolia** DC.

Ghansali 900 m. ; *Uniyal* 1605.

## CARYOPHYLLACEAE

- Sagina procumbens** Linn.  
Mataya 2100 m. ; *Uniyal* 3890.
- Silene griffithii** Boiss.  
Mataya 2700 m. ; *Saxena* 1378.
- S. inflata** Benth.  
Duphand 2100 m. ; *Uniyal* 3436.
- S. venosa** Aschers.  
Gangi 2700 m. ; *Uniyal* 1450.
- Stellaria decumbens** Edgew.  
Tali 3600 m. ; *Saxena* 1287.
- S. latifolia** Benth.  
Duphand 2100 m. ; *Uniyal* 639.
- S. media** Linn.  
Mataya 2400 m. ;  
*Uniyal* & *Dey* 1226.

## HYPERICACEAE

- Hypericum dyeri** Rehder.  
Duphand 2100 m. ; *Saxena* 1336.
- H. elodeoides** Choisy.  
Ponwali 3300 m. ; *Uniyal* 1491.
- H. hookerianum** Wall.  
Ponwali 3000 m. ; *Uniyal* 3310.
- H. oblongifolium** Choisy.  
Chamba 1600 m. ; *Uniyal* 551.
- H. perforatum** Linn.  
Banchuri 1600 m. ; *Uniyal* 717.

## MALVACEAE

- Abutilon graveolens** Wt. & Arn.  
Tehri 700 m. ; *Uniyal* 3690.
- Hibiscus cannabinus** Linn.  
Ghuttu 1200 m. ; *Dey* 1327.
- Sida cordifolia** Linn.  
Ghuttu 1000 m. ; *Uniyal* 3664.
- S. veronicaefolia** Lamk.  
Ghuttu 1200 m. ; *Dey* 1327.

## TILIACEAE

- Grewia sapida** Roxb.  
Ghansali 900 m. ; *Uniyal* 751.

## LINACEAE

- Reinwardtia indica** Dum.  
Banchuri 1600 m. ; *Uniyal* 3883.



## VITACEAE

- Leea edgeworthii** Santapau                      **Vitis lanata** Roxb.  
 Ghansali 900 m. ; *Uniyal* 751.                      Duphand 2700 m. ; *Uniyal* 1309.

## ACERACEAE

(Sapindaceae)

- Acer caesium** Wall. ex Brandis  
 Duphand 2700 m. ; *Uniyal* 1309.

## HIPPOCASTINACEAE

(Sapindaceae)

- Aesculus indica** Colebr.                      **Cardiospermum halicacabum** Linn.  
 Gangi 2400 m. ; *Uniyal* 790.                      Indrola 900 m. ; *Uniyal* 3644.

## STAPHYLEACEAE

(Sapindaceae)

- Staphylea emodi** Wall. ex Brandis  
 Gangi 2400 m. ; *Uniyal* 825.

## ANACARDIACEAE

- Lannea coromandelica** (Houtt.) **R. parviflora** Roxb.  
 Merr.    Tehri 600 m. ; *Uniyal* 422.  
 Ghansali 900 m. ; *Uniyal* 755.
- R. wallichii** Hook. f.  
 Ghansali 900 m. ; *Uniyal* 1642  
 & 1335.
- Pistacia integerrima** Stew.  
 Ghonti 900 m. ; *Uniyal* 446 &  
 3625.
- Rhus cotinus** Linn.  
 Ghansali 900 m. ; *Uniyal* 577.

## CORIARIACEAE

- Coriaria nepalensis** Wall.  
 Banchuri 1600 m. ; *Uniyal* 1723.



## CAESALPINACEAE

- |   |   |
|---|---|
| <b>Bauhinia vahlii</b> W. & A.<br>Ghansali 900 m. ; <i>Dey</i> 1376.      | <b>Cassia leschenaultii</b> Wall.<br>Ghuttu 1500 m. ; <i>Saxena</i> 1141. |
| <b>Caesalpinia sepiaria</b> Roxb.<br>Ghansali 900 m. ; <i>Uniyal</i> 721. | <b>C. laevigata</b> Willd.<br>Ghansali 900 m. ; <i>Uniyal</i> 761.        |

## PAPILIONACEAE

- |  |   |
|--|---|
| <b>Atylosia scarabaeoides</b> Benth.<br>Ghuttu 1300 m. ; <i>Uniyal</i> 1079.         | <b>Thermopsis barbata</b> Royle<br>Tali 3600 m. ; <i>Saxena</i> 827.        |
| <b>Crotalaria albida</b> Heyne ex Roth.<br>Ghuttu 1500 m. ; <i>Uniyal</i> 641.       | <b>Trigonella gracilis</b> Benth.<br>Tali 3600 m. ; <i>Uniyal</i> 876.      |
| <b>Desmodium microphyllum</b> (Thunb.)<br>DC.<br>Ghuttu 1200 m. ; <i>Saxena</i> 778. | <b>T. emodi</b> Benth.<br>Ponwali 3000 m. ; <i>Uniyal</i> 3306.             |
| <b>Lathyrus luteus</b> Baker<br>Gangi 2400 m. ; <i>Uniyal</i> 1161.                  | <b>Piptanthus nepalensis</b> D. Don<br>Mataya 2800 m. ; <i>Uniyal</i> 3103. |
| <b>Lespedeza stenocarpa</b> Maxim.<br>Ghansali 900 m. ; <i>Saxena</i> 1062.          | <b>Uraria neglecta</b> Prain<br>Ghansali 900 m. ; <i>Uniyal</i> 2079.       |
| <b>Lotus corniculatus</b> Linn.<br>Gangi 2700 m. ; <i>Saxena</i> 858.                | <b>U. picta</b> Desv.<br>Ghansali 900 m. ; <i>Uniyal</i> 786.               |
| <b>Indigofera gerardiana</b> Wall.<br>Ghonti 900 m. ; <i>Uniyal</i> 707.             | <b>Vicia tenera</b> Grah.<br>Gaja 2100 m. ; <i>Uniyal</i> 598.              |
| <b>I. dosua</b> Buch.-Ham.<br>Ponwali 3000 m. ; <i>Uniyal</i> 3867.                  |   |

## ROSACEAE

- |   |  |
|---|--|
| <b>Agrimonia eupatorium</b> Linn.<br>Gangi 2400 m. ; <i>Saxena</i> 847.         | <b>Deutzia staminea</b> R. Br.<br>Ghansali 900 m. ; <i>Uniyal</i> 580. |
| <b>Cotoneaster obtusa</b> Wall. ex Lindl.<br>Maghu 3300 m. ; <i>Uniyal</i> 685. | <b>Fragaria vesca</b> Linn.<br>Ponwali 2700 m. ; <i>Saxena</i> 1221.   |
| <b>C. bacillaris</b> Wall.<br>Duphand 2400 m. ; <i>Uniyal</i> 3398.             | <b>Geum elatum</b> Wall.<br>Tali 3600 m. ; <i>Uniyal</i> 874.          |

- G. urbanum** Linn.  
Kalayani 2400 m. ; *Saxena* 1188.
- Potentilla kleiniana** Wt. & Arn.  
Poibagi 2100 m. ; *Dey* 1121.
- P. sibbaldi** Wall.  
Ponwali 1700 m. ; *Saxena* 1224.
- P. microphylla** D. Don  
Tali 3600 m. ; *Saxena* 869.
- P. gerardiana** Lindl.  
Ponwali 2700 m. ; *Uniyal* 1303.
- P. atrosanguinea** Lodd.  
Tali 3600 m. ; *Uniyal* 878.
- P. fulgens** Wall.  
Poibagi 2100 m. ; *Uniyal* 3452.
- Prunus cerasoides** D. Don  
Ghuttu 1500 m. ; *Dey* 1119.
- Prunus cornuta** Wall.  
Mataya 2700 m. ; *Dey* 1111.
- P. padus** Linn.  
Ponwali 2700 m. ; *Saxena* 1248.
- Pyrus pashia** Buch.-Ham.  
Ghonti 900 m. ; *Uniyal* 647.
- P. lanata** D. Don  
Poibagi 2700 m. ; *Uniyal* & *Saxena* 1237.
- Rubus niveus** Thunb.  
Ghansali 900 m. ; *Uniyal* 578.
- R. ellipticus** Sm.  
Ghansali 900 m. ; *Uniyal* 576.
- R. paniculatus** Sm.  
Poibagi 2700 m. ; *Uniyal* 1236.
- Rosa sericea** Lindl.  
Poibagi 2700 m. ; *Uniyal* 687.
- R. moschata** Mill.  
Ghansali 900 m. ; *Uniyal* 584.
- Sorbus foliolosa** (Wall.) Spach.  
Poibagi 2400 m. ; *Saxena* 1251.
- Spiraea bella** Sims.  
Gangi 2400 m. ; *Uniyal* 813.
- S. vestita** Wall.  
Poibagi 2400 m. ; *Uniyal* 1446.

## SAXIFRAGACEAE

- Bergenia ciliata** (Roxb.) Raizada  
Poibagi 2400 m. ; *Uniyal* 1683.
- B. ligulata** Engl.  
Maghu 2700 m. ; *Uniyal* 674.
- B. stracheyi** Engl.  
Rupagali 3800 m. ; *Uniyal* 1670 & 3847.
- Deutzia straminea** R. Br.  
Ghuttu 1500 m. ; *Dey* 1128.
- Hydrangea anomala** D. Don  
Ponwali 3000 m. ; *Uniyal* 664.
- H. altissima** Wall.  
Kalayani 2700 m. ; *Uniyal* 806.
- Parnassia nubicola** Wall. ex Royle  
Mataya 2900 m. ; *Uniyal* 1502.
- Ribes alperstre** Wall. ex Decne  
Khatlingh 3900 m. ; *Uniyal* 1425.
- Saxifraga diversifolia** Wall.  
Tali 3600 m. ; *Uniyal* 1499.

CRASSULACEAE

**Sedum trifidum** Linn.

Ponwali 3000 m. ; *Uniyal* 1509.

DROSERACEAE

**Drosera lunata** Buch.-Ham.

Gangi 2400 m. ; *Saxena* 1150.

LYTHRACEAE

**Punica granatum** Linn.

Indrola 800 m. ; *Uniyal* 642.

**Woodfordia fruticosa** Kurz.

Ghansali 900 m. ; *Uniyal* 586.

ONAGRACEAE

**Hartmania rosea** G. Don

Banchuri 1500 m. ; *Uniyal* 620.

COMBRETACEAE

**Terminalia chebula** Retz.

Sarana 900 m. ; *Uniyal* 1322.

**T. belirica** Roxb.

Sarana 900 m. ; *Uniyal* 3886.

CUCURBITACEAE

**Bryonopsis laciniosa** (Linn.) Naud.

Ghonti 900 m. ; *Uniyal* 3624.

**Trichosanthes bracteata** (Lam.)

Voigt.

Ghansali 900 m. ; *Uniyal* 1324.

UMBELLIFERAE

**Angelica glauca** Edgew.

Rajkhark 3300 m. ; *Uniyal* 3607.

**B. maddeni** C.B.C.

Ponwali 2700 m. ; *Uniyal* 1439.

**Bupleurum lanceolatum** Wall.

Gangi 2400 m. ; *Uniyal* 3421.

**Centella asiatica** (L.) Urb.

Ghonti 900 m. ; *Uniyal* 3170.





- S. nudicaulis** Buch.-Ham.  
Ghansali 900 m. ; *Uniyal* 581.
- Sphaeranthus senegalensis** DC.  
Ghansali 900 m. ; *Saxena* 730.
- Solidago virga-aurea** Linn.  
Ponwali 3300 m. ; *Uniyal* 1506.
- Tanacetum longifolium** Wall.  
Tali 3600 m. ; *Saxena* 1275.
- Taraxacum officinale** Wigg.  
Ponwali 3000 m. ; *Uniyal* 1671.
- Tragopogon gracilis** D. Don  
Gangi 2100 m. ; *Saxena* 1156.
- Vicoa indica** DC.  
Ghansali 900 m. ; *Uniyal* 763.

## CAMPANULACEAE

- Campanula colorata** Wall.  
Ghuttu 900 m. ; *Uniyal* 770.
- C. latifolia** Linn.  
Ponwali 3000 m. ; *Uniyal* 1501.
- Cyananthus lobatus** Wall. ex Benth.  
Ponwali 3000 m. ; *Uniyal* 1488.

## ERICACEAE

- Cassiope fastigiata** D. Don  
Tali 3600 m. ; *Uniyal* 821.
- Gaultheria nummularioides** D. Don  
Mataya 2400 m. ; *Saxena* 1099.
- G. trichophylla** Royle  
Mataya 2400 m. ; *Saxena* 1098.
- Lyonia ovalifolia** (Wall.) Drude.  
Ghuttu 1800 m. ; *Uniyal* 1227.
- Rhododendron anthopogon** D. Don  
Tali 3600 m. ; *Uniyal* 1296.
- R. arboreum** Smith  
Ghuttu 1600 m. ; *Uniyal* 1134.
- R. campanulatum** D. Don  
Rajkhark 3300 m. ; *Uniyal* 1286.
- R. lepidotum** Wall.  
Tali 3600 m. ; *Saxena* 819.

## PLUMBAGINACEAE

- Plumbago zeylanica** Linn.  
Ghansali 900 m. ; *Uniyal* 573.

## PRIMULACEAE

- Androsace lanuginosa** Wall.  
Poibagi 2400 m. ; *Uniyal* 684.
- A. rotundifolia** Hardw.  
Gangi 2100 m. ; *Uniyal* 1455.

- |   |   |
|---|---|
| <b>A. umbellata</b> Merr.<br>Chamba 1500 m. ; <i>Saxena</i> 1047.                     | <b>L. lobelioides</b> Wall.<br>Ghansali 900 m. ; <i>Uniyal</i> 749.   |
| <b>Lysimachia alternifolia</b> Wall. ex<br>Roxb.<br>Tali 3800 m. ; <i>Saxena</i> 772. | <b>L. pyramidalis</b> Wall.<br>Ghansali 900 m. ; <i>Uniyal</i> 749.   |
| <b>L. chenopodioides</b> Wall. ex Hook. f.<br>Gangi 2100 m. ; <i>Saxena</i> 1142.     | <b>Primula petiolaris</b> Wall.<br>Poibagi 2500 m. ; <i>Dey</i> 1256. |
| <b>L. japonica</b> Thunb.<br>Gangi 2100 m. ; <i>Saxena</i> 1147.                      | <b>P. stewartii</b> Wall.<br>Tali 3300 m. ; <i>Uniyal</i> 862.        |

MYRSINACEAE

- Maesa indica** (Roxb.) Wall.  
Ghansali 900 m. ; *Saxena* 732.

SYMPLOCACEAE

(Styraceae)

- Symplocos chinensis** (Lour.) Druce  
Ghuttu 1500 m. ; *Uniyal* 695.

OLEACEAE

- |   |  |
|---|--|
| <b>Jasminum dispersum</b> Wall.<br>Ghuttu 1800 m. ; <i>Uniyal</i> 1112. | <b>J. pubescens</b> Willd.<br>Ghansali 900 m. ; <i>Saxena</i> 688.                                     |
| <b>J. humile</b> Linn.<br>Ghuttu 1800 m. ; <i>Uniyal</i> 1112.          | <b>Syringa emodi</b> Wall. ex D. Don<br>Ponwali 3000 m. ; <i>Uniyal</i> &<br><i>Saxena</i> 678 & 1235. |
| <b>J. officinale</b> Linn.<br>Ponwali 1800 m. ; <i>Uniyal</i> 1218.     |  |

APOCYNACEAE

- |   |  |
|---|--|
| <b>Carissa opaca</b> Stapf.<br>Ghuttu 1200 m. ; <i>Uniyal</i> 1076. | <b>Vallisneria heynei</b> Spreng.<br>Indrola 900 m. ; <i>Uniyal</i> 705. |
|---|--|

## ASCLEPIADACEAE

- |  |  |
|--|--|
| <b>Asclepias curassavica</b> Linn.<br>Ghuttu 1500 m. ; <i>Uniyal</i> 1093.   | <b>Hoya longifolia</b> Wall.<br>Ghansali 900 m. ; <i>Uniyal</i> 699.   |
| <b>Cryptolepis buchanani</b> R. & S.<br>Indrola 900 m. ; <i>Uniyal</i> 3678. | <b>Marsdenia roylei</b> Wight.<br>Ghuttu 1500 m. ; <i>Uniyal</i> 1118. |
| <b>Cynanchum glaucum</b> Wall.<br>Poibagi 2400 m. ; <i>Saxena</i> 1208.      | <b>Tylophora govani</b> Decne.<br>Ghuttu 1500 m. ; <i>Uniyal</i> 1619. |
| <b>C. vincetoxicum</b> Pers.<br>Poibagi 2400 m. ; <i>Uniyal</i> 1252.        |  |

## GENTIANACEAE

- |  |  |
|--|--|
| <b>Gentiana carinata</b> Griseb.<br>Tali 3600 m. ; <i>Saxena</i> 861.    | <b>Swertia alata</b> Royle<br>Ponwali 3000 m. ; <i>Uniyal</i> 3620.      |
| <b>G. pedicellata</b> Wall.<br>Gangi 2100 m. ; <i>Uniyal</i> 799.        | <b>S. angustifolia</b> Buch.-Ham.<br>Ghuttu 900 m. ; <i>Uniyal</i> 1620. |
| <b>Halenia elliptica</b> D. Don<br>Ponwali 3000 m. ; <i>Uniyal</i> 1486. | <b>S. purpurascens</b> Wall.<br>Banchuri 1800 m. ; <i>Uniyal</i> 3644.   |

## BORAGINACEAE

- |   |   |
|---|---|
| <b>Cynoglossum micranthum</b> Desf.<br>Ponwali 3300 m. ; <i>Dey</i> 1325.               | <b>Lindelofia spectabilis</b> Lehm.<br>Tali 3600 m. ; <i>Saxena</i> 885.            |
| <b>C. wallichii</b> D. Don<br>Ponwali 3000 m. ; <i>Uniyal</i> 1415.                     | <b>Macrotomia benthami</b> DC.<br>Tali 3600 m. ; <i>Saxena &amp; Uniyal</i><br>863. |
| <b>Hackelia glochidiata</b> (A. DC.)<br>Brand.<br>Ponwali 3000 m. ; <i>Uniyal</i> 3876. | <b>Trichodesma indicum</b> R. Br.<br>Sarana 900 m. ; <i>Uniyal</i> 696.             |

## CONVOLVULACEAE

- |  |   |
|--|---|
| <b>Evolvulus alsinoides</b> Linn.<br>Tehri 600 m. ; <i>Dey</i> 1072.     | <b>I. purpurea</b> Lam.<br>Ghuttu 1800 m. ; <i>Uniyal</i> 1207. |
| <b>Ipomoea hederifolia</b> Linn.<br>Ghansali 900 m. ; <i>Saxena</i> 742. |   |



SOLANACEAE

- |  |  |
|--|--|
| <b>Datura stramonium</b> Linn.<br>Ghuttu 1500 m.; <i>Uniyal</i> 4280.      | <b>Solanum nigrum</b> Linn.<br>Ghonti 900 m.; <i>Uniyal</i> 4269.      |
| <b>Nicandra physaloides</b> Gaertn.<br>Ghuttu 1800 m.; <i>Uniyal</i> 1144. | <b>S. verbascifolium</b> Linn.<br>Ghansali 900 m.; <i>Uniyal</i> 1312. |
| <b>Nicotiana tabacum</b> Linn.<br>Ghansali 900 m.; <i>Uniyal</i> 768.      | <b>Withania somnifera</b> Dunal.<br>Tehri 700 m.; <i>Uniyal</i> 4229.  |
| <b>Physalis minima</b> Linn.<br>Indrola 900 m.; <i>Uniyal</i> 4270.        |  |

ARISTOLOCHIACEAE

- Aristolochia dilatata** N.E. Brown  
Gangi 2400 m.; *Uniyal* 852.

SCROPHULARIACEAE

- |   |  |
|---|--|
| <b>Hemiphragma heterophyllum</b> Wall.<br>Ponwali 3000 m.; <i>Saxena</i> 661<br>& <i>Uniyal</i> 1269. | <b>P. gracilis</b> Wall. ex Benth.<br>Mataya 2700 m.; <i>Uniyal</i> 3387.                        |
| <b>Lagotis glauca</b> Gaertn.<br>Tali 3600 m.; <i>Saxena</i> 865.                                     | <b>Picrorhiza kurroa</b> Benth.<br>Rajkhark, Ponwali 3300-3600 m.;<br><i>Uniyal</i> 1667 & 3843. |
| <b>Mazus surculosus</b> D. Don<br>Ghansali 900 m.; <i>Saxena</i> 756.                                 | <b>Scrophularia himalensis</b> Royle<br>Ghuttu 1500 m.; <i>Saxena</i> 1300.                      |
| <b>Lathraea squamaria</b> Linn.<br>Tali 3600 m.; <i>Uniyal</i> 672.                                   | <b>Veronica javanica</b> Bl.<br>Kalayani 2400 m.; <i>Saxena</i> 1180                             |
| <b>Pedicularis bicornuta</b> Klotz<br>Mataya 2400 m.; <i>Saxena</i> 1465.                             |  |

GESNERIACEAE

- |   |   |
|---|---|
| <b>Didissandra lanuginosa</b> C. B. Cl.<br>Ghuttu 1200 m.; <i>Saxena</i> 725. | <b>Didymocarpus sabalternans</b> Wall.<br>Gangi 2400 m.; <i>Saxena</i> 782. |
|---|---|

## ACANTHACEAE

- Adhatoda vasica** Nees  
Indrola 900 m.; *Uniyal* 3682.
- Rungia pectinata** Nees  
Ghonti 900 m.; *Uniyal* 650.
- Barleria cristata** Linn.  
Ghansali 900 m.; *Uniyal* 1606.
- Pteracanthus alatus** (Wall. ex Nees)  
Brem.  
Gangi 2100 m.; *Saxena* 1371.

## VERBENACEAE

- Callicarpa macrophylla** Vahl  
Ghansali 900 m.; *Uniyal* 729  
& 588.
- Premna barbata** Wall. ex Shauer.  
Sarana 900 m.; *Uniyal* 1068.
- Clerodendrum serratum** Spreng.  
Sarana 900 m.; *Uniyal* 1616 &  
697.
- P. latifolia** Roxb.  
Ghuttu 1500 m.; *Saxena* 3892.
- Pygmaeopremna herbacea** (Roxb.)  
Moldenke  
Sarana 900 m.; *Uniyal* 3871.

## LABIATAE

- Ajuga bracteosa** Wall.  
Pukhar 1200 m.; *Dey* 1063.
- Micromeria biflora** Benth.  
Ghuttu 1500 m.; *Uniyal* 680.
- A. parviflora** Benth.  
Mataya 2700 m.; *Uniyal* 1206.
- Prunella vulgaris** Linn.  
Gangi 2400 m.; *Uniyal* 1176.
- Anisomeles indica** Ktze.  
Ghansali 900 m.; *Saxena* 777.
- Roylea cinerea** (D. Don) Baill.  
Pukhar 1200 m.; *Uniyal* 1083.
- Calamintha umbrosa** Benth.  
Chamba 1200 m.; *Uniyal* 580.
- Salvia plebeia** Br.  
Ghuttu 1500 m.; *Saxena* 752 &  
1229.
- Lamium album** Linn.  
Duphand 2700 m.; *Uniyal* 1250.
- Teucrium royleanum** Wall.  
Ghonti 900 m.; *Uniyal* 710.
- Leucas lanata** Benth.  
Ghonti 900 m.; *Uniyal* 649.
- Thymus serpyllum** Linn.  
Sahshratal 3800 m.; *Uniyal*  
1376.
- L. mollissima** Wall.  
Ghonti 900 m.; *Uniyal* 651.

PLANTAGINACEAE

**Plantago major** Linn.  
Ponwali 3000 m.; *Uniyal* 1283.

AMARANTHACEAE

<b>Alternanthera sessilis</b> R. Br. Ghansali 900 m.; <i>Uniyal</i> & <i>Saxena</i> 733 & 775.	<b>Aerva sanguinolenta</b> (L.) Blume Ghuttu 1200 m.; <i>Uniyal</i> 1084.
	<b>Celosia argentea</b> Linn. Ghansali 900 m.; <i>Uniyal</i> 759.

POLYGONACEAE

<b>Fagopyrum cymosum</b> Meis. Ghuttu 1500 m.; <i>Uniyal</i> 1073.	<b>P. sphaerostachyum</b> Meis. Ponwali 3500 m.; <i>Uniyal</i> 890.
<b>Polygonum amplexicaule</b> D. Don Gangi 2400 m.; <i>Uniyal</i> 1178.	<b>P. vacciniifolium</b> Wall. ex Meis. Ponwali 3000 m.; <i>Uniyal</i> 1505.
<b>P. capitatum</b> Buch.-Ham. Ghuttu 1500 m.; <i>Saxena</i> 1085.	<b>Rheum emodi</b> Wall. Khatling 4000 m.; <i>Uniyal</i> 3880.
<b>P. chinense</b> Linn. Gangi 2400 m.; <i>Saxena</i> 788.	<b>Rumex hastatus</b> D. Don Ghansali 900 m.; <i>Uniyal</i> 585.
<b>P. nepalense</b> Meis. Ghuttu 1500 m.; <i>Uniyal</i> 1091.	

PIPERACEAE

**Peperomia tetraphylla** (G. Forst.) Hook. & Arn.  
Ghansali 900 m.; *Saxena* 736.

LAURACEAE

<b>Cinnamomum tamala</b> Nees Indrola 1000 m.; <i>Uniyal</i> 701.	<b>Machilus gamblei</b> King Poibagi 2100 m.; <i>Uniyal</i> 714.
<b>Litsea umbrosa</b> Nees Gangi 2100 m.; <i>Saxena</i> 800.	

## THYMELEACEAE

- Daphne papyracea** Decne.                      **Wickstroemia canescens** Meis.  
 Poibagi 2100 m.; *Uniyal* 1288.              Mataya 2400 m.; *Uniyal* 1388.

## ELAEAGNACEAE

- Elaeagnus umbellata** Thunb.  
 Kalayani 2400 m.; *Uniyal* 1181.

## LORANTHACEAE

- Scurrula elata** (Edgew.) Dans.              **Viscum nepalense** Spreng.  
 Parasitic on *Lynoia ovalifolia* ;              Parasitic on *Loranthus* sp. on  
 Ghuttu 1500 m.; *Saxena* 1253.              *Quercus incana*, at Poibagi  
 2100 m. ; *Uniyal* & *Saxena*  
**Taxillus vestitus** (Wall.) Dans.              1222 & 1655.  
 Parasitic, growing on rocks, at  
 Ghuttu 1500 m.; *Uniyal* 1656.

## SANTALACEAE

- Osyris wightiana** Wall. ex Wight  
 Ghansali 900 m.; *Uniyal* 728.

## EUPHORBIACEAE

- Andrachne cordifolia** Muell.-Arg.              **Mallotus philippinensis** Muell.-Arg.  
 Ghuttu 1200 m.; *Uniyal* 744.              Ghonti 900 m.; *Uniyal* 890.  
**Euphorbia pilosa** Linn.                      **Phyllanthus parvifolius** Ham.  
 Poibagi 2400 m.; *Uniyal* 1103.              Ghuttu 1800 m.; *Uniyal* 1654.  
**E. royleana** Boiss.                              **Sarcococca saligna** Muel.-Arg.  
 Ghonti 900 m.; *Dey* 1059.              Ghuttu 1500 m.; *Uniyal* 1094.  
**Glochidion velutinum** Wight  
 Ponwali 3000 m.; *Uniyal* 1065.

## URTICACEAE

- Celtis tetrandra** Roxb.                      **Debregeasia hypoleuca** Wedd.  
 Ghonti 900 m.; *Uniyal* 724.              Ghuttu 1500 m.; *Dey* 1229.

**Ficus clavata** Wall.

Ghuttu 1500 m.; *Uniyal* 1058.

**Pilea scripta** Wedd.

Gangi 2100 m.; *Saxena* 791.

**F. palmata** Forsk.

Ghuttu 1500 m.; *Uniyal* 1059.

**Trema politoria** Planch.

Ghuttu 1200 m.; *Uniyal* 1087.

**Maoutia puya** Wedd.

Ghansali 900 m.; *Saxena* 1323.

#### JUGLANDACEAE

**Engelhardtia spicata** Bl.

Pukhar 1200 m.; *Uniyal* 1133.

#### MYRICACEAE

**Myrica nagi** Thunb.

Banchuri 1500 m.; *Uniyal* 721.

#### BETULACEAE

**Alnus nepalensis** D. Don

Poibagi 2400 m.; *Uniyal* 1110.

**Carpinus viminea** Lindl.

Mataya 2400 m.; *Saxena* 1114.

**Betula utilis** D. Don

Tali 3800 m.; *Uniyal* 3878.

#### FAGACEAE

**Quercus incana** Roxb.

Banchuri 1500 m.; *Uniyal* 3800.

**Q. semecarpifolia** Sm.

Ponwali 3000 m.; *Uniyal* 1221.

#### SALICACEAE

**Salix elegans** Wall. ex Anderss.

Rajkhark 3300 m.; *Uniyal*  
4270.

**S. tetrasperma** Roxb.

Ghuttu 1800 m.; *Uniyal* 4271.

#### ORCHIDACEAE

**Calanthe tricarinata** Lindl.

Gangi 2400 m.; *Saxena* 1186.

**Cephalanthera ensifolia** Richard

Tali 3600 m.; *Uniyal* 668.

- Cypripedium cordigerum** D. Don  
Tali 3600 m.; *Uniyal* 6669.
- Dendrobium alpestre** Royle  
Ghuttu 1800 m.; *Uniyal* 3620.
- Eulophia campestris** Wall.  
Ponwali 3000 m.; *Uniyal* 664 & 892.
- E. herbacea** Lindl.  
Pukhar 1500 m.; *Uniyal* 1318.
- Eria alba** Lindl.  
Gangi 2100 m.; *Uniyal* 783.
- Habenaria intermedia** D. Don  
Ghuttu 1800 m.; *Uniyal* 794.
- Herminium monorchris** Br.  
Ghuttu 1500 m.; *Uniyal* 1311.
- Luisia teretifolia** Gaud.  
Ghansali 900 m.; *Uniyal* 700.
- Microstylis muscifera** (Lindl.)  
O. Kuntze  
Ponwali 3000 m.; *Uniyal* 3617.
- Orchis latifolia** Linn.  
Ponwali 3000 m.; *Uniyal* 833 & 3345.
- Pholidota articulata** Lindl.  
Pukhar 1500 m.; *Uniyal* 3885.
- Vanda parviflora** Lindl.  
Ghonti 900 m.; *Uniyal* 590.

## SCITAMINACEAE

- Roscoea procera** Wall.  
Gangi 2100 m.; *Uniyal* 1349.
- R. alpina** Royle  
Poibagi 2100 m.; *Uniyal* 3875.
- Curcuma angustifolia** Roxb.  
Ghuttu 1500 m.; *Uniyal* 3640.

## HYPOXIDACEAE

- Hypoxis aurea** Lour.  
Ghuttu 1500 m.; *Uniyal* 1152.

## IRIDACEAE

- Iris ensata** Thunb.  
Gangi 2400 m.; *Saxena* 795.

## DIOSCOREACEAE

- Dioscorea deltoidea** Wall.  
Ghuttu 1500 m.; *Uniyal* 1100.

## LILIACEAE

- Allium stracheyi** Baker  
Kinkoliya Khal 3600 m.;  
*Uniyal* 3894.
- A. govanianum** Wall.  
Tali 3600 m.; *Uniyal* 3852.
- Asparagus curillus** Buch.-Ham.  
Ghonti 900 m.; *Uniyal* 448.
- A. gracilis** Royle  
Indrola 900 m.; *Uniyal* 703 &  
1089.
- A. filicinus** Buch.-Ham.  
Gangi 2400 m.; *Uniyal* 3894.
- Disporum pullum** Salisb.  
Ghuttu 1500 m.; *Uniyal* 1118.
- Fritillaria roylei** Hook.  
Mataya 2800 m.; *Saxena* 658.
- F. cirrhosa** D. Don  
Ponwali 3000 m.; *Uniyal* 1188.
- Lilium polyphyllum** D. Don  
Ponwali 3000 m.; *Uniyal* 1459.
- L. roseum** Wall.  
Banchuri 1500 m.; *Uniyal* 4228.
- Nomocharis oxypetala** (Royle)  
Balf. f.  
Tali 3600 m.; *Uniyal* 879.
- N. nana** (Klotzsch.) E. H.  
Tali 3600 m.; *Uniyal* 3879.
- Polygonatum cirrhifolium** Royle  
Gangi 2400 m.; *Uniyal* 763 &  
3876.
- P. verticillatum** All.  
Ponwali 3000 m.; *Uniyal* 616.
- Smilax aspera** Wall.  
Indrola 1000 m.; *Uniyal* 616.
- S. parvifolia** Wall.  
Ghuttu 1500 m.; *Uniyal* 694.
- Trillium govanianum** Wall.  
Ponwali 3000 m.; *Uniyal* 662.

## JUNCACEAE

- Juncus membranaceus** Royle  
Ponwali 3000 m.; *Uniyal* 889.

## ARACEAE

- Arisaema tortuosum** Schott.  
Ghuttu 1800 m.; *Uniyal* 784.
- Remusatia hookeriana** Schott.  
Mataya 2100 m.; *Uniyal* 716.
- Gonatanthus pumilus** (D. Don)  
Engl. & Krause.  
Mataya 2400 m.; *Uniyal* 1307.

## TAXACEAE

**Taxus baccata** Linn.

Ponwali 3000 m.; *Uniyal* 872 & 1266.

## PINACEAE

**Abies pindrow** (Royle) Spach.

Ponwali 3000 m.; *Saxena* 873.

**Pinus excelsa** Wall.

Ganwali 2100 m.; *Uniyal* 4273.

**Pinus roxburghii** Sargent

Ghonti 900 m.; *Uniyal* 618.

**Cedrus deodara** Loud.

Gangi 2400 m.; *Uniyal* 435.

## CUPRESSACEAE

**Juniperus communis** Linn.

Kinkolya-khal 3600 m.; *Uniyal*  
4228.

**J. recurva** Buch.

Khatalingh 4200 m.; *Uniyal*  
4275.

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